

(b) a protein encoded by the nucleotide sequence of SEQ ID NO: 7; and

(c) a protein having a hydrophobic cluster analysis (HCA) score with the kappa-carrageenase of *Alteromonas carrageenovora* which is greater than or equal to 75% over the domain extending between amino acids 117 and 262 of the amino acid sequence of *Alteromonas carrageenovora* that is SEQ ID NO: 6.

13. (New) A protein according to claim 12, wherein the HCA score is greater than or equal to 80%.

14. (New) A protein according to claim 12, wherein the HCA score is greater than or equal to 85%.

15. (New) A protein according to Claim 12, comprising an amino acid sequence depicted in SEQ ID NO: 6, wherein the protein is extracted from *Alteromonas carrageenovora*.

16. (New) A protein according to Claim 12, comprising an amino acid sequence depicted in SEQ ID NO: 8, wherein the protein is extracted from *Cytophaga drobachiensis*.

17. (New) A method of producing kappa-oligocarrageenans, comprising

(a) genetically modifying a host cell with a nucleic acid molecule having SEQ ID NO: 5 or SEQ ID NO: 7, or with a vector comprising a nucleic acid molecule having SEQ ID NO: 5 or SEQ ID NO: 7;

(b) culturing the host cell until a protein having glycosyl hydrolase activity is produced;

(c) isolating the protein having glycosyl hydrolase activity;

(d) contacting the isolated protein having glycosyl hydrolase activity with a